UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,630	11/13/2001	Edward G. Callway	ATI.0100570	5733

34456	7590	04/20/2005

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EXAMINER
NATNAEL, PAULOS M

ART UNIT	PAPER NUMBER
2614	

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

<table>
<tr><td rowspan="3">Office Action Summary</td><td>Application No.
10/008,630</td><td>Applicant(s)
CALLWAY ET AL.</td></tr>
<tr><td>Examiner
Paulos M. Natnael</td><td>Art Unit
2614</td></tr>
</table>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>18 October 2004</u>.

2a)☐ This action is **FINAL**.　　2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1,3-9 and 11-42</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>24-42</u> is/are allowed.

6)☒ Claim(s) <u>1,3-9 and 11-23</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All　b)☐ Some * c)☐ None of:

　　.1.☐ Certified copies of the priority documents have been received.

　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims **1,3-9,11-23** are rejected under 35 U.S.C. 103(a) as being unpatentable

over West et al. et al. U.S. Patent No. 6,339,434 in view of Slavin, U.S. 6,751,362.

Considering claim **1**, West et al. disclose all claimed subject matter, note;

a) receiving a first set of pixel values representing a portion of a first image frame at a

first resolution, wherein the first set of pixel values represent a first pattern with a first

rate of change, is met by multiplier 64, fig. 7A. (see also Fig.7B)

b) generating a second set of pixel values related to the first set of pixel values to

represent the first pattern with a second rate of change, wherein the second pattern is

related to the first pattern and the second rate of change is less than the first, is also

met by multiplier 64, fig. 7A.

c) re-sampling the second set of pixel values to generate a portion of a second image

frame, wherein the second image frame represents the first image frame at a second

resolution, different from the first resolution, is met by adder 65, fig. 7A.

except for;

d) wherein generating a second set of pixel values includes replicating pixel values from

the first set of pixel values.

Regarding d), West discloses that sample rate converters increase or decrease

the image size by a factor of Lx/Mx in the horizontal dimension and Ly/My in the vertical

dimension..." (see Abstract) West further teaches that after a vertical value is

calculated, a new phase is calculated that defines the next set of coefficients to use for

calculating the next vertical value. The data used for the next vertical value may

advance to the next pixel in the rows. For the case of **up sampling, since new lines**

are being created, *the same pixels may be used to produce two vertical values for*

two separate output rows, though the weight each pixel is given will vary as the

coefficients have been updated. Col. 5, lines 44-51. [emphasis added by examiner]

Thus, although West does not specifically use the term replication, West is not entirely

silent either about this well known method of image processing. Slavin discloses a pixel

resampling system and method for text as well as for image and uses simple pixel

replication for up-sampling text by integer ratios which typically produce excellent

results. col. 2, lines 35-36. Slavin discloses a pixel engine 212 that receives the

graphics data and a resampling circuit 228 that facilitates resizing or resampling the

graphics images. col. 5, lines 3-18. Therefore, it would have been obvious to the skilled

in the art at the time the invention was made to modify the system of West by utilizing

the well known pixel replication method to generate the second set of pixels from the

original or first set of pixel. Doing so would enhance the image with less processing or

interpolation of pixel data which may be taxing to the image scaling circuitry of West et

al. as a whole.

Considering claim **3**, the method as in Claim 1, wherein the portion of the second image

frame includes a set of image pixels representing at least a portion of a line of the first

image frame, is implied because the input pixels are multiplied by coefficient value and

the product is added in generate the second image.

Considering claim **4**, the method as in Claim 1, wherein the first pattern includes a

portion of text, is inherent because the image would, if desired, include image of text

data as well.

Considering claim **5**, the method as in Claim 1, wherein re-sampling includes bi-linear

re-sampling, is met by the disclosure that "Aspect ratio conversion is used on non-linear

image conversions where the image is stretched or condensed to the new format more

significantly on the outer regions than in the center of the image where the alteration to

the image would be more noticeable. For example, if the image is reformatted for a

format that is wider, but the same height as the original format, the aspect of the image

changes. A stretching effect can be done in a non-linear fashion to preserve the

integrity of the center of the image at the expense of the outer portions of the image."

(col. 6, lines 14-23)

Considering claim **6**, the method as in Claim 1, wherein the step of re-sampling includes

multi-tap filtering, is met by Fig.7A and 7B, which utilizes multiple tap FIR filtering. (see

also fig.2)

Considering claim **7**, the method as in Claim 1, wherein the second resolution is greater

than the first resolution, is met by the disclosure that "An image scaling circuit for

increasing or decreasing the size of the sampled image to match a fixed resolution

display." (Abstract, see also col. 10, lines 1-15)

Considering claim **8**, the method as in Claim 1, wherein the step of re-sampling includes

generating **alpha values** for interpolating the portion of the second image from the

second set of pixels, is met by the value of the coefficient input to the second input of

the adder 65, fig.7A.

Considering claim **9**, a computer readable medium tangibly embodying a program of

instructions, said program of instructions comprising instructions to: receive a first set of

pixel values representing a portion of a first image frame at a first resolution, wherein

the first set of pixel values represent a first pattern with a first rate of change; generating

a second set of pixel values related to the first set of pixel values to represent the first

pattern with a second rate of change, wherein the second pattern is related to the first

pattern and the second rate of change is less than the first; and re-sampling the second

set of pixel values to generate a portion of a second image frame, wherein the second

image frame represents the first image frame at a second resolution.

Regarding claim 9, see rejection of claim 1. (See also Fig. 5 which illustrates a

flowchart for sample rate conversion processing which would be performed by a

computer).

Regarding the newly added limitation, see rejection of claim 1 (d) above.

Considering claim **11**, the method as in Claim 9, wherein the portion of the second

image frame includes a set of image pixels representing at least a portion of a line of the

first image frame.

Regarding claim 11, see rejection of claim 3.

Considering claim **12**, the method as in Claim 9, wherein the first pattern includes a

portion of text.

Regarding claim 12, see rejection of claim 4.

Considering claim **13**, the method as in Claim 9, wherein re-sampling includes bi-linear

re-sampling.

Regarding claim 5, see rejection of claim 5.

Considering claim **14**, the method as in Claim 9, wherein the step of re-sampling includes multi-tap filtering.

Regarding claim 14, see rejection of claim 6.

Considering claim **15**, the method as in Claim 9, wherein the second resolution is greater than the first resolution.

Regarding claim 15, see rejection of claim 7.

Considering claim **16**, the method as in Claim 9, wherein the step of re-sampling includes generating alpha values for interpolating the portion of the second image from the second set of pixels.

Regarding claim 16, see rejection of claim 8.

Regarding claim **17**, see rejection of claim 1.

Considering claim **18**, the system as in Claim 17, wherein said replication unit performs replicates pixel values according to an integer scale value, is met by the disclosure that "It is generally known that image scaling can be accomplished using sample rate conversion where the sample rate converter scales by a rational number L/M where L and M are positive integers. (col. 1, lines 46-65) and A sample rate converter according to claim 1 wherein the up sampler means is arranged to increase the up sample rate by a selected integer. (see col. 11, lines 23-25)

Considering claim **19**, the system as in Claim 17, wherein said first input includes a set of latches to store said first set of pixel values, is met by line memories 80. fig.7B.

Regarding claim **20**, see rejection of claim 6.

Considering claim **21**, the system as in Claim 20, wherein interpolation includes generating alpha values to represent relative positions of pixels in the second image frame in relation to the pixels of the second set of pixel values.

Regarding claim 21, see rejection of claim 8.

Considering claim **22**. The system as in Claim 17, wherein said second resolution is greater than said first resolution.

Regarding claim 22, see rejection of claim 7.

Considering claim **23**, the system as in Claim 17, further including a pixelated display to display the second image frame, wherein a display resolution associated with the pixelated display is equivalent to the second resolution, is met by disclosure that "the display controller 150 generates timing signals to control the pixelated output display device (col. 10, lines 16-17) and that "an image scaling circuit for increasing or decreasing the size of the sampled image to match a fixed resolution display." (see Abstract)

Response to Arguments

3.   Applicant's arguments filed 10/18/04 regarding claims 1-23 have been fully

considered but they are not persuasive. Applicant argues that "Neither figures 7A and

&B nor the relate passages of West disclose that re-sampling of the scaling image data

is achieved as a result of the adders 65. " To the contrary, West discloses ...Referring

again to FIG. 6, for each output pixel, the contents of position register 59 are advanced

by the current down sample increment defined in register 53 (M register) using adder

54. The nearest integer up sample position in sequence 31 is determined by adding 1/2

to the value of register 59 using adder 55 and then truncating to an integer with

truncating circuit 58. The nearest input pixel to the right of sample 35 is found by

adding L-1 to the output of truncating circuit 58 using adder 60 and then zero filling

L.sub.2 least significant bits with circuit 61. Control register 47 specifies the value K,

which defines the up sample rate L=2.sup.K... [emphasis added] Hence, sampling may

be done according to the reference of West by using the various adding circuits.

Argument is not persuasive in that regard.

Allowable Subject Matter

4.   Claims **24-42** are allowed.

5.   The following is a statement of reasons for the indication of allowable subject

matter: the prior art fails to disclose a method comprising receiving an absolute alpha

value, wherein the absolute alpha value represents a position, within a first range of

alpha values, relative to a first source pixel, amplifying the absolute alpha value by a

factor to generate an amplified alpha value; and, normalizing the amplified alpha value

to generate a normalized alpha value so that the normalized alpha value represents a

position relative to the first range of alpha values, as in claim **24**; A method of scaling a

video image to match the display resolution of the display device, comprising: a first

latch to store a first pixel value, said first latch including: an input coupled to an output of

a pixel source to receive said first pixel value from a first set of pixel values; an output

coupled to: an input of a second latch; and a first input of a first multiplier; said second

latch to store a second pixel value, said second latch including: an input to receive said

second pixel value from said first latch; an output coupled to a first input of a second

multiplier; said first multiplier to multiply said first pixel value by a first modified alpha

coefficient and generate a first product, said first multiplier including: said first input

coupled to said output of said first latch; a second input coupled to a first output of an

alpha modifier to receive said first modified alpha coefficient; an output coupled to a first

input of an adder; said second multiplier to multiply said second pixel value by a second

modified alpha coefficient to generate a second product, said second multiplier

including: said first input coupled to said output of said second port; a second input

coupled to a second output of said alpha modifier to receive said second modified alpha

coefficient; an output coupled to a second input of said adder; an alpha coefficient

modifier to limit absolute alpha coefficients proximate to an edge of a range associated

with the absolute alpha coefficients to the edge, said absolute alpha coefficients

proximate to an edge to be used in said first multiplier and said second multiplier to

represent replications of pixels from said pixel source; a pixel source to provide said first

set of pixel values of a first image frame, wherein said set of pixel values represent a pattern at a first resolution; an accumulator to generate said absolute alpha coefficients, wherein said alpha coefficients are representative of a relative distance between an interpolated pixel and a first pixel associated with said first pixel value; and said adder to combine said first product and said second product to generate an interpolated pixel value, said adder including; said first input to receive said first product; said second input to receive said second product; and an output to provide said interpolated pixel value, wherein said interpolated value represents a pixel value of second set of pixel values, wherein said second set of pixel values represent said pattern at a second resolution, as in claim **38**;

Receiving an absolute blend value, between zero and one, associated with a relative distance between a first pixel and a second pixel; subtracting 0.5 from the absolute blend value to generate a shifted blend value; multiplying the shifted blend value by a factor to generate an expanded value; clipping the expanded value between -0.5 to +0.5 to generate a fixed value; adding 0.5 to the fixed value to generate a modified blend value; applying the modified blend value to the value of the first pixel to generate a first portion of a new pixel value; applying a difference between one and the modified blend value to the second pixel to generate a second portion of the new pixel value; and combining the first portion of the new pixel value and the second portion of the pixel value to generate the new pixel, as in claim **41**.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shyu et al. U.S. **5,825,367** discloses apparatus for real time two-dimensional scaling of a digital image.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (571) 272-7354. The examiner can normally be reached on 10:00am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PAULOS M. NATNAEL
PATENT EXAMINER

PMN
April 14, 2005